

Atty. Docket No. 2002-IP-007973U1 (1391-35300)

Patent

AMENDMENTS TO THE CLAIMS

Listing of Claims:

1. (Currently Amended) A process for cementing a subterranean formation, comprising:
 - (a) forming a cement composition comprising a cement and one or more beads combined with the cement; and
 - (b) introducing an inert gas phase to the cement composition via in situ formation of the inert gas while the cement composition is positioned in the well bore.
2. (Canceled)
3. (Original) The process of claim 1 wherein step (b) reduces an elastic modulus of the cement composition by from about 5% to about 90%.
4. (Original) The process of claim 1 wherein the beads are selected from the group consisting of cenospheres, glass spheres, ceramic spheres, and combinations therof.
5. (Canceled)
6. (Currently Amended) The process of claim 1 wherein the introducing the inert gas phase further comprises one or more of the following methods:
 - (i) adding a gas generating material to the cement composition;
 - (ii) adding a porous material to the cement composition; and
 - (iii) injecting gas directly into the cement slurry.
7. (Original) The process of claim 6, further comprising displacing the cement composition into a well bore in contact with the subterranean formation.
8. (Original) The process of claim 7 wherein the gas generating material is a nitrogen generating material, and further comprising introducing an oxidizing agent to the cement composition, the oxidizing agent being capable of activating the nitrogen generating material.

Atty. Docket No. 2002-IP-007973U1 (1391-35300)

Patent

9. (Original) The process of claim 8 wherein the oxidizing agent is introduced to the cement composition prior to the displacing the cement composition, and wherein the nitrogen generating material is introduced to the cement composition during the displacing the cement composition such that the oxidizing agent activates the nitrogen generating material, thereby producing gas in the cement composition.

10. (Original) The process of claim 8 wherein the nitrogen generating material is introduced to the cement composition prior to the displacing the cement composition, and wherein the oxidizing agent is introduced to the cement composition during the displacing the cement composition such that the oxidizing agent activates the nitrogen generating material, thereby producing gas in the cement composition.

11. (Original) The process of claim 8 wherein the nitrogen generating material and the oxidizing agent are concurrently introduced to the cement composition during the displacing the cement composition.

12. (Original) The process of claim 8 wherein the nitrogen generating material is selected from the group consisting of hydrazine, hydrazine salt of an acid, azodicarbonamide, azobis(isobutyronitrile), p-toluene sulfonyl hydrazide, p-toluene sulfonyl semicarbazide, p-p'-oxybis(benzenesulfonylhydrazide), carbodihydrazide, and combinations thereof.

13. (Original) The process of claim 8 wherein the oxidizing agent is selected from the group consisting of ammonium persulfate, sodium persulfate, potassium persulfate, sodium chlorite, sodium perborate, sodium peroxy carbonate, calcium hypochlorite, sodium hypochlorite, sodium bromite, sodium hypobromite, sodium bromate, sodium chlorate, and combinations thereof.

14. (Original) The process of claim 6 wherein the gas generating material is a hydrogen generating material.

Atty. Docket No. 2002-IP-007973U1 (1391-35300)

Patent

15. (Original) The process of claim 14 wherein the hydrogen generating material is selected from the group consisting of aluminum, calcium, zinc, magnesium, lithium, sodium, potassium, and combinations thereof.
16. (Original) The process of claim 14 wherein the hydrogen generating material is an aluminum powder.
17. (Canceled)
18. (Original) The process of claim 1 wherein the inert gas phase is present in the cement composition in an amount effective to maintain a density of the cement composition in a range of from about 8 to about 23 lb/gal when one or more of the beads break.
- 19 – 31. (Canceled)
32. (New) A method for cementing a well bore, the method comprising:
 - selecting a desired density for a down hole cement composition;
 - forming a cement composition having an actual density at the surface;
 - estimating a change in the actual density when the cement composition is positioned down hole; and
 - adding an inert gas to the cement composition, the inert gas compensating for the estimated change in the actual density such that the actual density is about equal to the desired density when the cement composition is positioned down hole.
33. (New) The method of claim 32 wherein the cement composition comprises a plurality of beads, and wherein the change in actual density results from the breakage of at least one of the beads when the cement composition is positioned in the well bore.

Atty. Docket No. 2002-IP-007973U1 (1391-35300)

Patent

34. (New) The method of claim 32 wherein inert gas phase is added to the cement composition via in situ formation of the inert gas while the cement composition is positioned down hole.
35. (New) The method of claim 32 wherein the pressure exerted on the cement composition by the formation is at least 1,000 pounds per square inch.
36. (New) The method of claim 32 wherein the compressive strength of the cement composition is at least 2,000 pounds per square inch.